

Patent Claims:

1. Method of detecting growth of the dynamic tire circumference (circumferential growth or tire growth), characterized in that
  - at least one reference value Ref is produced on the basis of wheel speed information, said reference value representing in particular a sidewise and/or crosswise relation of the motor vehicle wheels,
  - the time variation of the reference value(s) is examined, and
  - tire growth is detected on the basis of said variation.
2. Method as claimed in claim 1, characterized in that the reference values produced are compared with acquired learned values, and tire growth is detected based on the comparison.
3. Method as claimed in claim 1 or 2, characterized in that learned values for predetermined speed intervals are learned individually.
4. Method as claimed in at least one of claims 1 to 3, characterized in that the circumferential growth is individually examined in predetermined speed ranges.
5. Method as claimed in at least one of claims 1 to 4, characterized in that it is considered in a first, low speed interval whether circumferential growth has already occurred in a second interval of higher speed.

6. Method as claimed in at least one of claims 1 to 5,  
c h a r a c t e r i z e d in that in the case that the vehicle is in a predetermined speed interval for longer than a predetermined time, it is assumed that the circumferential growth in this interval is completed.
7. Method of detecting tire air pressure loss as claimed in at least one of claims 1 to 6,  
c h a r a c t e r i z e d in that one or more current reference values are compared with one or more learned values, and tire pressure loss is concluded in dependence on the deviation(s) of the reference value(s) on the learned value.
8. Method as claimed in claim 7,  
c h a r a c t e r i z e d in that the pressure loss detection system is deactivated while circumferential growth takes place or is detected.
9. Method as claimed in claim 7 or 8,  
c h a r a c t e r i z e d in that the sign of the rotational speed variation of the examined wheel is evaluated for making a distinction between pressure loss and circumferential growth.
10. Method as claimed in at least one of claims 7 to 9,  
c h a r a c t e r i z e d in that the first derivative of  $Ref(t)$  and the absolute rate of the deviation from the learned value is examined for making a distinction between pressure loss and circumferential growth.

11. Method as claimed in at least one of claims 1 to 10,  
c h a r a c t e r i z e d in that for determining the  
mounting position of the wheel displaying tire growth

- a comparison is made of the variation of or the  
deviations from learned values between at least two,  
in particular three, differently determined reference  
values,

and the differently determined reference values differ  
from each other in that they represent in particular  
diagonal relations, side relations and axle relations.

12. Method as claimed in claim 11,  
c h a r a c t e r i z e d in that tire growth is  
concluded when the at least two, in particular three,  
reference values independently of each other allow  
detecting tire growth, which is especially possible by  
examining and comparing the sign of the observed  
variations of reference values.

13. Method as claimed in at least one of claims 1 to 12,  
c h a r a c t e r i z e d in that the deviation between  
a reference value and a learned value for this reference  
value is examined, and a probability value is raised when  
this deviation of a first threshold value DDS\_FOR\_GROW is  
exceeded.

14. Method as claimed in claim 11,  
c h a r a c t e r i z e d in that the probability value  
has a probability threshold COUNT\_GR, the exceeding of  
which signals that tire growth prevails, and the degree of

probability indicated by the probability counter depends on how frequently the threshold value DDS\_FOR\_GROW was exceeded during a defined period of time.

15. Method as claimed in claim 13 or 14,

c h a r a c t e r i z e d in that the probability value is raised only when one or more of the additional conditions

- signal quality of the reference values,
- quality of the roadway condition or
- road section covered within a predetermined range

is/are satisfied in addition.

16. Method as claimed in at least one of claims 1 to 15,

c h a r a c t e r i z e d in that tire growth is not concluded in the case that one or more reference values exceed a threshold value DDS\_MAX\_GROW.

17. Method as claimed in at least one of claims 1 to 16,

c h a r a c t e r i z e d in that the method of detecting new tires is reset into an initial condition when a tire change reset signal, such as a DDS-Reset in particular, is detected.

18. Method as claimed in at least one of claims 1 to 17,

c h a r a c t e r i z e d in that if growth of a new tire is detected, an indirect pressure loss detection system (DDS) operating on the basis of the wheel speeds is reset into an initial condition (DDS-Reset).